

BRD3N50AF

Rev.A Apr.-2024

/ Descriptions

TO-252 N MOS

N-CHANNEL MOSFET in a TO-252 Plastic Package.

/ Features

$V_{DS}=500V$ $I_D=3A$

$R_{DS(ON)}@10V \leq 3.5\Omega$ (Typ. 2.8Ω)

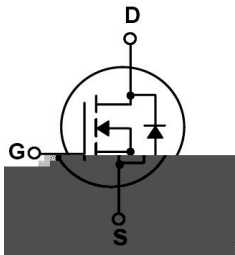
Fast Switching.

HF Product.

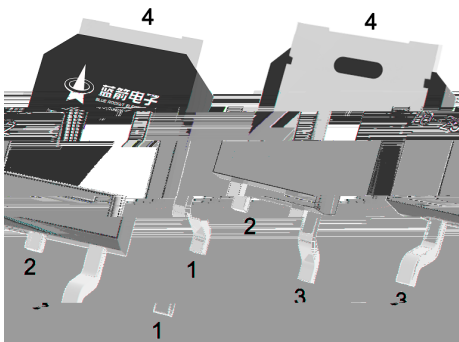
/ Applications

These devices are well suited for power switch circuit of adaptor and charger, intergrate fast recovery diode.

/ Equivalent Circuit



/ Pinning



PIN1 G

PIN 2 D

PIN 3 S

PIN 4 D

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	500	V
Drain Current	$I_D(T_c=25^\circ\text{C})$	3	A
Drain Current - Pulsed	I_{DM}	6	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy	E_{AS}	90	mJ
Avalanche Current	I_{AS}	4.5	A
Power Dissipation	$P_D(T_c=25^\circ\text{C})$	45	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	
Junction to Ambient	$R_{\theta JA}$	100	/W
Junction to Case	$R_{\theta JC}$	2.78	/W

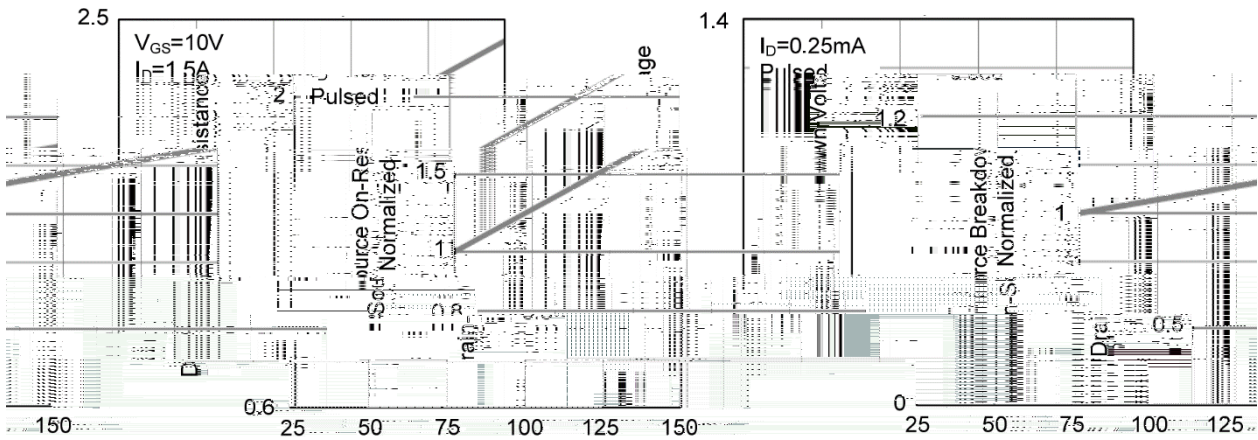
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	500			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500V$ $V_{GS}=0V$			1	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 30V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=1.5A$		2.8	3.5	Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=3.0A$			1.4	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		220		pF
Output Capacitance	C_{oss}			130		
Reverse Transfer Capacitance	C_{rss}			5		
Total Gate Charge	Q_G	$V_{DS}=400V$ $I_D=3.0A$ $V_{GS}=10V$		12.5		nC
Gate-Source Charge	Q_{GS}			3.2		
Gate-Drain Charge	Q_{GD}			4.2		

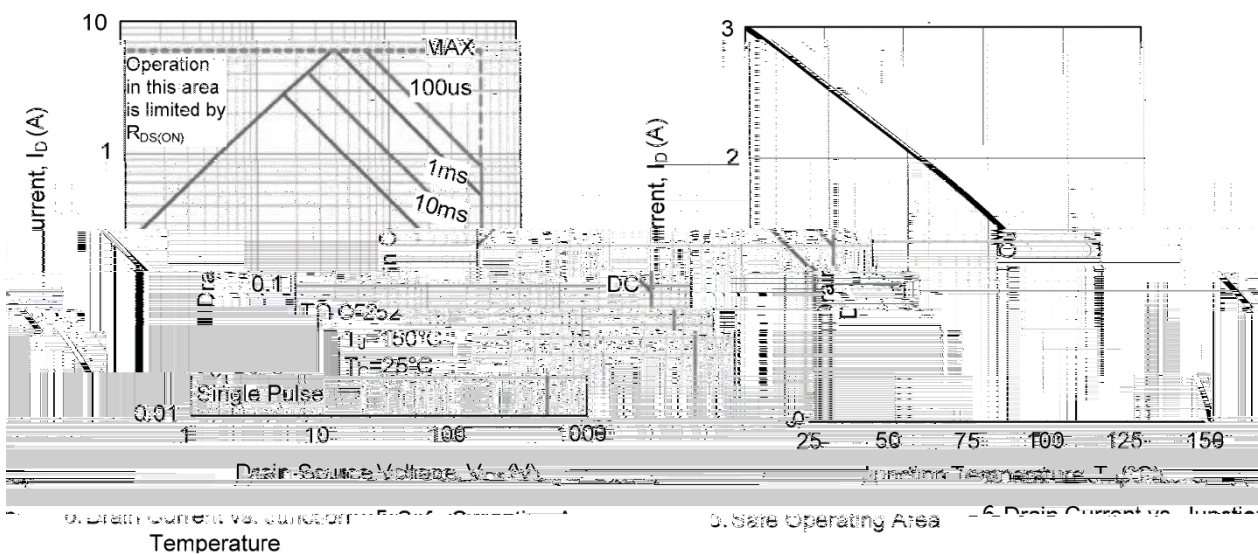
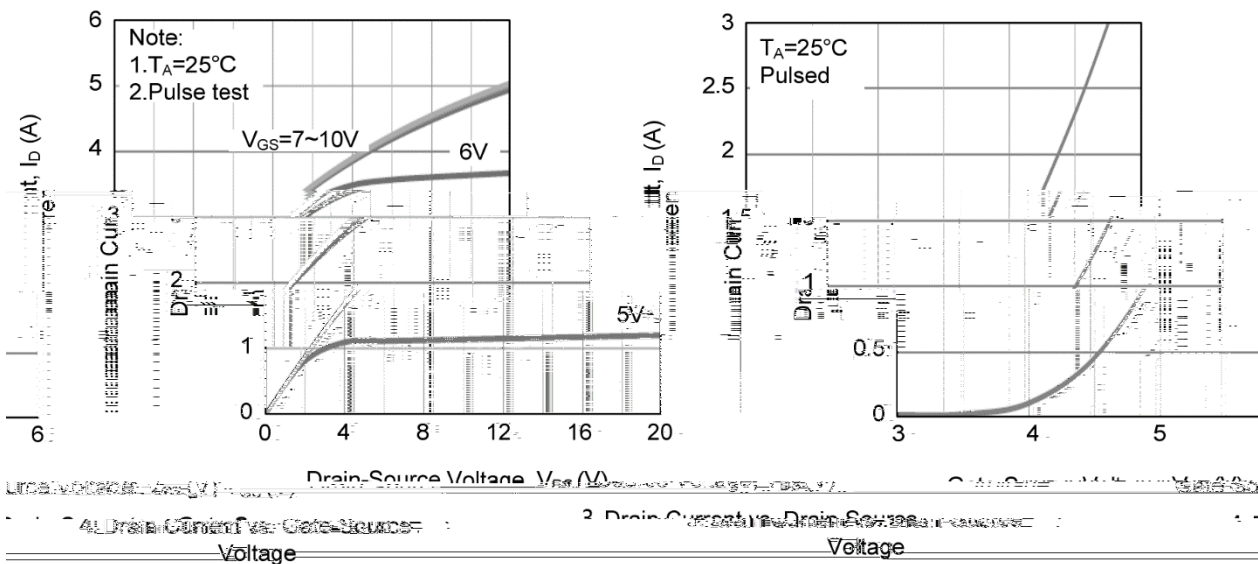
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=100V \quad I_D=3.0A$ $V_{GS}=10V \quad R_G=25\Omega$		5.2		ns
Turn-On Rise Time	t_r			20.3		
Turn-Off Delay Time	$t_{d(off)}$			45		
Turn-Off Fall Time	t_f			28		
Maximum Continuous Drain-Source Diode Forward Current	I_S				3	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				6	A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V \quad I_S=3.0A$ $dI_F/dt=100 A/\mu s$		64		ns
Reverse Recovery Charge	Q_{rr}			0.8		μC

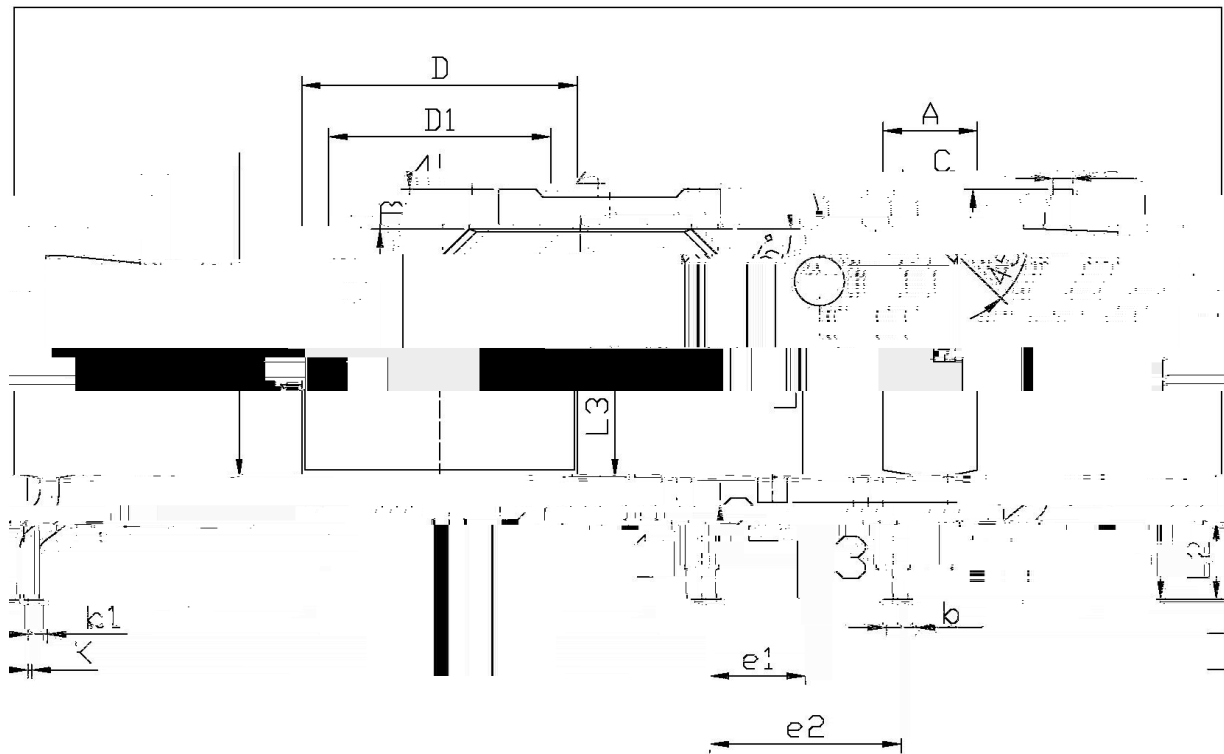
/ Electrical Characteristic Curve



1. Drain-Source Resistance vs. Junction Temperature T_J (°C) $V_{GS}=10V$ $I_D=1.5A$ Pulsed
2. Drain-Source Resistance vs. Junction Temperature T_J (°C) $I_D=0.25mA$ Pulsed



/ Package Dimensions

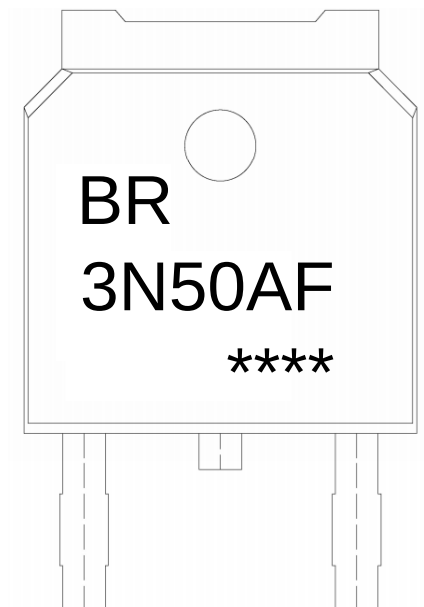


单位：mm

Dimensions In Millimeters			Dimensions In Millimeters		
Symbol	Max.	Min.	Symbol	Max.	Min.
E	5.95	6.25	A	2.20	2.40
E1	2.24	2.34	B	0.95	1.25
D1	9.85	10.35	B1	0.70	0.90
C	1.15	0.55	I2	1.70	2.00
b	6.75	7.30	D	0.90	1.00
L3	6.75	7.30	D1	10.10	10.50
K	5.10	5.50			

T0-252

/ Marking Instructions



BR

3N50AF

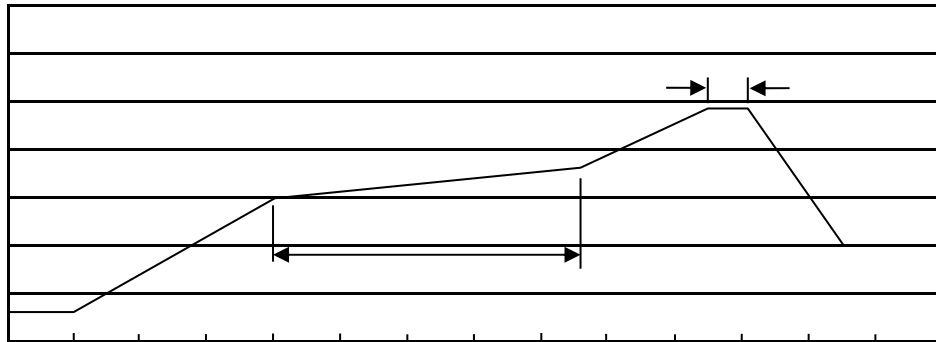
Note:

BR: Company Code

3N50AF: Product Type Code

*****: Lot No. Code, code change with Lot No

() / Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- | | | | | | |
|---|-------|-----|-----------|--------|---|
| 1 | 150 | 180 | 60 | 90sec; | 1.Preheating:150~180 , Time:60~90sec. |
| 2 | 245±5 | | 5±0.5sec; | | 2.Peak Temp.:245±5 , Duration:5±0.5sec. |
| 3 | | 2 | 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

/ Resistance to Soldering Heat Test Conditions

260±5 10±1 sec. Temp.:260±5 Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type	Units					Dimension (unit mm ³)		
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	6	30,000	13 ×16	360×360×50	380×335×366

/ TUBE

Package Type	Units					Dimension (unit mm ³)		
	Units/Tube /	Tubes/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Tube	Inner Box	Outer Box
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

/ Notices